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UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
Washington 25, D.C.

FIELD MEMORANDUM SCS-#1160

Re: Guide to Assistance in
Watershed Protection Projects

September 28, 1953

TO ALL RANKING FIELD OFFICERS:

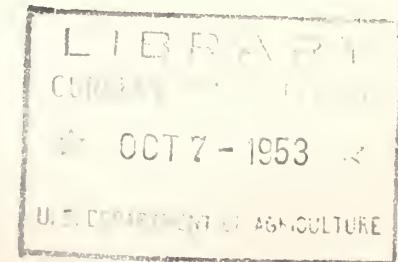
This Field Memorandum outlines Service objectives, policies, and criteria for carrying out Watershed Protection Projects in cooperation with local, State and other Federal agencies and the people living in the watersheds. It provides a basic framework for the development of more detailed regional guides on procedure.

In recognition of the growing public interest in watershed protection, the Congress appropriated \$5,000,000 for use in fiscal year 1954 to permit a start to be made on some 50 or more small Watershed Protection Projects for demonstrational purposes in some 34 states. The estimated total Federal cost of these projects is \$28,706,000. It is expected that local people will contribute at least an equal amount to carrying out these projects over a period of not more than five years.

The Congress has indicated its intent that this program shall be carried out to (1) provide experience in developing sound procedures for local-State-Federal cooperation in achieving the watershed objectives of local people; and (2) demonstrate the actual physical results of a planned watershed program by determining increased productivity, decreased erosion, decreased floodwater and sediment damages, and other benefits resulting from the watershed improvements.

These projects will be carried out under the authority of the Soil Conservation Act of 1935 (Public Law No. 46, 74th Congress). The appropriation, which is a separate item in the 1954 Appropriation Act, provides only such authority as is contained in this basic legislation. Hence, the appropriation does not provide for certain forms of assistance, such as irrigation and drainage, which are being provided to soil conservation districts and other cooperators under the authority of other laws.

The Soil Conservation Service has been assigned general responsibility within the Department of Agriculture for the Watershed Protection program. The Forest Service and other agencies will cooperate with the Service in carrying out certain phases of this program, which are within their respective fields of responsibility. The Forest Service will have specific functional responsibility on:



To All Ranking Field Officers - 2 - September 28, 1953

- (a) All lands under the administration of the Forest Service
- (b) All fire control work in cooperation with State agencies
- (c) Other forest and woodland areas in accordance with the outline of responsibilities approved by the Under Secretary on November 13, 1951, and attached to SCS Field Memorandum 1141.

OBJECTIVES

The objective of the Watershed Protection program will be to complete, as nearly as practicable within a period of five years, a program of flood prevention and soil and water conservation in each designated watershed that will provide reduction to the fullest practicable extent of floodwater, sediment and land damages occurring within and downstream from the watershed.

PARTICIPATION

The success of watershed projects is largely dependent upon the extent to which concerned local people and their agencies participate in planning and carrying out the watershed program. The Service will participate in this program by assisting soil conservation districts in program development, and in securing the cooperation of other local agencies concerned in the installation and maintenance of the program.

It is recognized that local agencies and organizations other than soil conservation districts and various State and Federal agencies will have responsibilities in this activity in many watersheds and must participate in the program if it is to be successful. These include special purpose districts (watershed districts, conservancy districts, flood control districts, etc.), watershed associations, counties, municipalities, state soil conservation committees, Land Grant Colleges, state planning commissions, state foresters, state engineers or water-resource agencies and state wildlife agencies. These agencies will have responsibilities in program formulation, planning, scheduling, financial participation, installation, and maintenance. Other groups and agencies with special interests will include civic and sportsmen's organizations, state associations of soil conservation districts supervisors and farm organizations.

The Service has a direct responsibility to collaborate and coordinate plans with other Federal agencies and Inter-State Compact Commissions where such agencies have constructed, authorized, or proposed projects or administer lands or programs within the watershed that would be affected by the watershed protection improvements. The principal concerned Federal agencies may be the Corps of Engineers, Bureau of Reclamation, Bureau of Land Management and other land-managing agencies and the Fish and Wildlife Service.

All agencies and groups participating in the cooperative development of work plans will be provided copies of the work plan.

To All Ranking Field Officers - 3 - September 28, 1953

PLANNING CRITERIA

Basis of Service Assistance

Service assistance in Watershed Protection Projects will be based on:

1. A physical plan of improvements and management for the watershed, cooperatively developed by all concerned individuals, groups, and agencies on the basis of an adequate resource inventory, survey of needs and a determination of economic practicability.
2. A goal and a time schedule for carrying out the plan, with agreement on responsibilities and costs to be assumed by each participant in the program for installation and maintenance of improvements.

Watershed Work Plans

A watershed work plan will be prepared for each Watershed Protection Project under the sponsorship of the Soil Conservation Districts with the technical assistance of the Service and with full participation of all interests concerned including local, State and other Federal agencies. The work plan should contain the information outlined in the Service work plan guide, but may contain in addition such further descriptive material or details as may be needed to make it serve most effectively as the local "charter" for carrying out the project.

Planning Objectives

In assisting in the development of watershed plans, Service personnel will be guided by the following objectives (1) to so plan and locate watershed improvement measures as to protect the maximum area of land subject to flooding; (2) to encroach to the least possible extent on productive alluvial flood plain or other land of high agricultural productivity with measures that retard water or store sediment; (3) to limit the total capacity below the emergency spillway of any single structure to net more than 5,000 acre-feet except in cases approved by the Chief of the Service; (4) to aim at providing a sufficient degree of protection to encourage landowners to make full and continuous agricultural use of land now subject to overflow; (5) to design for full protection against flood damage from major storms only in those cases where non-agricultural values justify a high degree of protection in conjunction with the principal objective of protecting agricultural lands; (6) to participate in the cost of installing water control measures only when the land-treatment measures needed to assure their reasonable protection and successful functioning are installed or are in the process of installation; and (7) to install only those measures or groups of interdependent measures which provide benefits in excess of costs.

Priority of Land Treatment

It is the Service policy in this program to encourage districts to give high priority within the watershed to the installation of soil and water conservation measures on farms and ranches where lack of such measures would adversely affect the design and maintenance of needed water control measures, such as floodwater-retarding and sediment-control structures and stream-channel improvements. It is recognized, however, that in many cases, land-treatment measures can be properly installed and maintained only in conjunction with water control and disposal measures. In these cases the Service will encourage the concurrent installation of such measures.

To All Ranking Field Officers - 4 - September 28, 1953

Classification of Watershed Measures

Conditions governing the use of funds available to the Service for carrying out watershed protection projects require a separation of measures into three categories, namely: (1) "A" measures, (2) "B" measures, and (3) other measures. This separation will be shown in watershed work plans.

"A" measures normally meet one or more of the following conditions:

(1) require group or agency action for installation, (2) must be installed by contract or force account, (3) produce benefits that are primarily "off-site", that is, not accruing to the landowner on whose land they are installed, or (4) yield little return or long-deferred return to the landowner on whose land the work is performed.

"A" measures have been defined as follows:

"1. Floodwater-retarding structures are built principally for the purpose of retarding or detaining flood flow. In some cases they may be installed primarily for the purpose of protecting land from inundation while in other cases they may be used principally to reduce the flow in order to provide a more economical system of stabilizing structures. A floodwater-retarding structure is usually an earth dam with a fixed drawdown tube of concrete, corrugated metal, or tile having an emergency spillway of concrete, or grass. The installation of this measure nearly always includes such items as seeding, sodding and fencing at the site where the measure is installed.

"2. Stabilizing and sediment-control measures are limited to those required to protect existing or newly developed waterways from erosion and sedimentation. The term waterway as used here is defined as being an open conduit (except terraces) used to convey water after it has been concentrated to such a degree that channel flow principles must be used to determine its behavior. The conduit may be of earth, rock, or other materials and may be lined with grass, rock, concrete, asphalt or other materials. Items such as drop spillways, chutes, drop inlets, ponds, desilting basins, debris barriers and basins, diversions, fencing, and establishment of vegetation are used in various combinations as integral parts of waterways.

"3. Subwatershed waterway improvement consists principally of stabilizing existing and development of needed 'waterways' located in a subwatershed. It generally consists of shaping and seeding or sodding of waterways and usually involves earth moving by drag line, bulldozer, and/or grader. Such items as drop spillways, drop inlets, and fencing are also sometimes used in combination as an integral part of this work.

"4. Stream channel improvement is used principally to prevent degradation of the stream channels and cutting of the stream banks in order to reduce sedimentation and the destruction of land. In some cases it is used to increase the capacity of a stream to carry water thereby reducing overbank flow. This work consists of the use of such items as jetties; riprap; debris barriers and basins; deflectors; channel charges; bank sloping; fencing; seeding; sodding; and tree, shrub, and vine planting, in various combinations as an integral part of the stream channel improvement.

To All Ranking Field Officers - 5 - September 28, 1953

"5. Diversion ditches and dikes are used to divert the flow of water for the purpose of reducing erosion and flooding. This measure usually includes such items as seeding and sodding in the immediate waterflow area.

"6. Floodways are used for the purpose of confining the overflow of a stream to certain areas of the flood plain and are generally accomplished by channel excavation, levees, and dikes. This measure may require seeding and sodding as well as water gates and other water-control appurtenances.

"7. Stabilization of critical runoff and sediment producing areas, which are not now suitable for cropland or pasture, is a measure primarily for flood prevention since the benefits derived from it are generally not of sufficient magnitude at the site of installation to be conducive for the landowner, including the Federal Government, to perform this work. The primary purpose of this measure is the reduction, beyond the site of installation, of damages from runoff and sediment. Included is the stabilization needed along transportation routes such as roads and railroads. In general, this work consists of such items as tree planting, seeding, sodding, establishment of shrubs and vines, diversions, special purpose terraces, check-dams and gully plugs, sloping and shaping. In some instances drop spillways, chutes and drop inlets are used."

(Quoted from Solicitor's Opinion 5547, dated August 11, 1952.)

The Solicitor's Opinion also includes an eighth category of measures for which the Forest Service and other agencies have primary responsibility. This category is as follows:

"8. Measures for which authorization is not adequate under 'going' program: For example, (a) acquisition of critical watershed lands outside of established national forests and purchase units and the related administrative and protective facilities, and (b) fire protection outside of authorized Clarke-McNary state cooperative areas."

"B" measures are defined as those measures other than "A" measures installed primarily to reduce runoff and soil erosion which (1) produce benefits primarily to the land on which the measures are installed and which individual landowners and operators normally can and will carry out with expectation of early financial returns on their own lands if given adequate technical assistance, and (2) which may be planned with funds appropriated for Watershed Protection.

Other measures, exclusive of A and B measures, are those that are needed in a complete watershed program, but which cannot be planned and installed with Watershed Protection funds appropriated under authority of Public 46. These measures include principally irrigation and drainage (both group and on-farm facilities) unless such measures are needed for the purpose of controlling soil erosion. Planning of such measures may be accomplished and included in watershed work plans, however, by charging that part of the planning cost to regular district assistance funds, if available, providing such action is requested by soil conservation district governing bodies.

To All Ranking Field Officers - 6 - September 28, 1953

ACP ASSISTANCE

The Service will cooperate with State and County PMA committees in using ACP assistance in the installation of the permanent-type practices included in watershed work plans. It should be recognized, however, that in accordance with the principle contained in Section 3G of the 1954 ACP Handbook, the total assistance provided by ACP for "A" Measures would be reduced by the amount of financial assistance provided through the watershed protection program. While recognizing this limitation, it will be the Service policy to:

1. Aid the community and county committeemen in selecting permanent-type practices for the County Agricultural Conservation Program which are included in watershed work plans.
2. Encourage landowners and operators to apply for and use available ACP assistance on the lands within the watershed for these measures included in the watershed work plan and according to the work plan time schedule.
3. Encourage landowners and operators to enter into pooling agreements to accomplish those measures within the watershed which require the participation of two or more farmers to complete the work.

Benefit-Cost Determinations

The Service will participate in providing other than technical assistance for installing "A" Measures in watershed project operations only when the total primary monetary benefits will exceed the total costs in accordance with the principles of evaluation described below. In exceptional cases and upon full justification therefor, the Chief may approve assistance if this condition is not met in watersheds where most of the costs of installing "A" Measures are to be borne by local people, secondary benefits are obviously high, or non-monetary values are highly significant.

In making benefit-cost determinations, part of the "A" Measures may be interrelated with the "B" Measures. Since a separate analysis of benefits and costs for each individual interrelated measure would not be practicable, proper evaluation can be approximated through estimating the total program effects expected with and without the interrelated "A" Measures. In general, this involves evaluating first only the "B" Measure program. The differences in benefits should exceed the difference in costs, if the addition of "A" Measures is to be considered economically feasible. Independent measures or groups of interdependent measures such as a floodwater-retarding structure functioning alone or a system of floodwater-retarding structures functioning as a unit will be evaluated separately to determine whether they are economically feasible.

Criteria for Cost-Sharing

The following criteria for cost-sharing will guide the studies to be made in determining the distribution of costs presented in work plans.

Congress has indicated that local people and local and State agencies will be expected to bear at least one-half of the cost of carrying out the watershed protection program. No fixed ratio of costs has been set for any individual watershed project. Nor has any fixed ratio of contribution by local interests to any specific measure been determined - except as noted below. As the responsible Federal agency, the Soil Conservation Service will seek to obtain

To All Ranking Field Officers - 7 - September 28, 1953

a minimum local contribution of 50 percent of the over-all costs of each project. The following types of local contributions will be credited by the Service toward the local share of costs, if provided, by non-Federal interests participating in carrying out the project.

- (1) Voluntary or paid services, directly related to the project, rendered in planning, supervision, and maintenance of the project by soil conservation districts or any other non-Federal local and State agencies or organizations.
- (2) Cost to landowners and operators of applying soil and water conservation "B" Measures that are provided for in the work plan including the fair value of labor, materials, equipment rental and cash outlay, and with deductions for ACP payments.
- (3) The fair market value of all lands, easements and rights-of-way, (and other costs incident thereto) contributed or purchased by local interests.
- (4) The fair market value of "A" Measure improvements provided for in the work plan and of installations for program evaluation when constructed by non-Federal agencies.
- (5) All cash funds transferred and the fair market value of all materials and equipment rental provided by local and State agencies toward installing "A" and "B" Measures provided in the work plan.

In order that appraisals of local contributions shall be equitable between projects two determinations of costs will be made in the work plan stage:

1. The total over-all cost of treating the watershed assuming that no conservation work has been done in it, and
2. The total cost of completing the treatment of the watershed beginning on the date of official designation by the Chief of the Service.

In evaluating the local share of the over-all costs set forth in No. 1 above, credit will be allowed for:

- (a) Installation cost to landowners and operators of "A" and "B" Measures of the types included in the work plan which have been previously installed and maintained by them in accordance with Service standards.
- (b) Planning and installation costs to non-Federal agencies of "A" Measures of the types included in the work plan which have been previously installed and maintained by existing local or State agencies which participate in carrying out the watershed protection project.

Credit cannot be allowed for these items (a) and (b) in evaluating local cost sharing in the completing of the program, No. 2 above, since the cost of work already performed would not be included in this cost figure.

Since the approved cost figures were based for the most part on sample areas used in flood control surveys that are some years old, the cost of the land treatment and other improvements installed in the interim may still be included in project costs as approved by the Chief.

To All Ranking Field Officers - 8 - September 28, 1953

At the time the work plan is completed an amendment to the project proposal shall be sent to the Chief reducing the project cost against this appropriation to the amount needed to complete the work in the watershed, Item 2 above.

Determination of Cost-Sharing - "A" Measures

In addition to the foregoing criteria for over-all cost sharing, it will be the Service policy to provide assistance in the installation of "A" Measures only on a cost-sharing basis. The Service will require that local groups or agencies, States or other non-Federal interests provide all land, easements, and rights-of-way. Moreover the Service will expect non-Federal interests to assume such proportionate share of the cost of "A" Measures (including land, easements and rights-of-way) as may be determined to be equitable in consideration of the anticipated benefits. Either Federal or non-Federal participation in cost-sharing may be by personal services, contracting, construction by force account, provision of materials and equipment or other services or by transfer of funds to the other participant(s).

Cost-sharing arrangements will be determined for each watershed. The cost to be borne by Federal and non-Federal agencies, subject to the availability of funds by appropriation or otherwise, shall be set forth in written agreements before Federal funds are used for contracting or provision of other assistance (except technical) in installation of "A" Measures.

Any cost-sharing of "A" Measures installed on Federal land will be determined on a case basis.

B-Measures

Cost-sharing for application of "B" Measures on privately-owned land will be guided by the current policies of the Soil Conservation Service, ACP, and Forest Service. The Federal Government will bear the cost of "B" Measures installed on Federal land.

Other Measures

The costs allocated to irrigation, drainage, and water supply (exclusive of technical assistance provided with regular Service district assistance funds) will be borne by local interests.

PUBLIC LANDS

Watershed work plans should cover all lands within a watershed regardless of ownership.

Where public lands are involved, the responsible land-managing agencies should be invited to participate in work plan development and in the installation of needed measures on lands under their jurisdiction. In watershed protection projects for which funds are specifically allocated, the Service may make agreements with land-managing agencies to install the measures or may transfer funds to such agencies to carry out the work for the Department within standards mutually agreed upon.

If no response is obtained from agencies responsible for public lands, improvement plans should provide, to the extent feasible, for the protection of adjacent lands from water and sediment originating on public lands.

LAND ACQUISITION

The Service will help local interests to adjust use of watershed lands within their capabilities and maintain them in stable and productive conditions, with a minimum of recourse to public ownership.

Where public acquisition offers the only practical solution to maintenance of stable conditions on critical runoff and sediment-source areas of watersheds, State and local government agencies and municipalities will be encouraged to acquire such lands and to assume responsibility for their proper management.

No land will be acquired by the Federal Government with Watershed Protection funds.

COMPLIANCE WITH STATE WATER LAWS

It is essential that Service personnel who are assisting local people and agencies in planning and carrying out watershed improvements understand the State laws relating to the use and disposal of water. The legal and financial responsibilities attached to the development of water-management measures are affected by State water laws and court decisions relating thereto in most States. Landowner and local agency cooperators should be informed of their responsibility to comply with the requirements of State water laws.

It is the policy of the Service to participate in the installation of any structure for the purpose of developing, storing, or diverting water for beneficial use, or for disposing of surplus water only after determining that the purposes which the structures are to serve and structural requirements are in accord with State water laws relating thereto.

MAINTENANCE

The Service will participate in maintenance only to the extent of furnishing technical assistance to aid in inspection and to advise local interests with respect to maintenance needed. In the maintenance of "A" measures on non-Federal land it shall be the policy of the Service to require that State or local agencies enter into agreements to operate and maintain such works of improvement prior to Federal participation in their installation. Landowners and operators will be expected to maintain the B measures installed on non-Federal land under agreements with soil conservation districts.

On Federal land, the cost of operating and maintaining A measures will be borne by the Federal Government or by local interests or jointly, as determined by mutual agreement in accordance with the accrual of benefits to the respective participants. Maintenance of B measures on Federal land will be the responsibility of the Federal Government.

To All Ranking Field Officers - 10 - September 28, 1953

PROJECT EVALUATION

It is the policy of the Service to evaluate the effects of a watershed protection program in both physical and economic terms. To properly evaluate the effects, it will be desirable to measure various physical and economic factors within the watershed and the changes brought about in them by the application of the program. This will include changes in runoff characteristics, flood and sediment damages, and production resulting from soil and water conservation improvements.

Robert M. Salter